

**CLAIMS:**

1           1.       A method for positioning pulses, comprising the steps of:  
2                   specifying pulse positioning over time in accordance with a time layout about  
3 a time reference,  
4                   generating a time-hopping code; and  
5                   mapping pulses over the time layout based on the time hopping code, wherein  
6 a pulse can be placed at any location within said time layout.

1           2.       The method of claim 1, wherein said time reference is a time position of a  
2 pulse.

1           3.       The method of claim 2, wherein said pulse is a preceding pulse.

1           4.       The method of claim 2, wherein said pulse is a succeeding pulse.

1           5.       The method of claim 1, wherein said time reference is at least one of a fixed  
2 and a non-fixed time reference.

1           6.       The method of claim 1, wherein said time hopping code has a predefined  
2 property.

1           7.       The method of claim 6, wherein the pre-defined property is at least one of  
2 spectral properties and correlation properties.

1           8.       The method of claim 7, wherein the correlation property comprises at least one  
2 of autocorrelation properties and cross-correlation properties.

1           9.       The method of claim 1, wherein said time-hopping code comprises at least one  
2 of a hyperbolic congruential code, quadratic congruential code, linear congruential code,  
3 Welch-Costas array code, Golomb-Costas array code, pseudorandom code, chaotic code, and  
4 Optimal Golomb Ruler code.

1           10.      The method of claim 1, wherein the time layout is comprised of a plurality of  
2 frames.

1           11.     The method of claim 10, wherein said frame is comprised of a plurality of  
2 sub-frames.

1           12.     The method of claim 11, wherein said sub-frame is comprised of a plurality of  
2 smaller components.

1           13.     The method of claim 12, wherein said smaller components are further  
2 subdivided.

1           14.     The method claim 1, wherein the time layout is a delta value layout.

1           15.     An impulse transmission system comprising:

2                   a Time Modulated Ultra Wideband Transmitter;

3                   a Time Modulated Ultra Wideband Receiver; and

4                   said Time Modulated Ultra Wideband Transmitter and said Time Modulated  
5 Ultra Wideband Receiver employ a time-hopping code, wherein said code specifies pulse  
6 positioning over time in accordance with a time layout about a time reference, and a pulse  
7 can be placed at any location within said time layout.

1           16.     The impulse transmission system of claim 15, wherein said time reference is a  
2 time position of a pulse.

1           17.     The impulse transmission system of claim 16, wherein said pulse is a  
2 preceding pulse.

1           18.     The impulse transmission system of claim 16, wherein said pulse is a  
2 succeeding pulse.

1           19.     The impulse transmission system of claim 15, wherein said time reference is at  
2 least one of a fixed and a non-fixed time reference.

1           20.     The impulse transmission system of claim 15, wherein said time hopping code  
2 has a predefined property.

1           21.     The impulse transmission system of claim 20, wherein the pre-defined  
2 property is at least one of spectral properties and correlation properties.

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1           22.   The impulse transmission system of claim 21, wherein the correlation property  
2 comprises at least one of autocorrelation properties and cross-correlation properties.

1           23.   The impulse transmission system of claim 15, wherein said time-hopping code  
2 comprises at least one of a hyperbolic congruential code, quadratic congruential code, linear  
3 congruential code, Welch-Costas array code, Golomb-Costas array code, pseudorandom  
4 code, chaotic code, and Optimal Golomb Ruler code.

1           24.   The impulse transmission system of claim 15, wherein the time layout is  
2 comprised of a plurality of frames.

1           25.   The impulse transmission system of claim 24, wherein said frame is comprised  
2 of a plurality of sub-frames.

1           26.   The impulse transmission system of claim 25, wherein said sub-frame is  
2 comprised of a plurality of smaller components.

1           27.   The impulse transmission system of claim 26, wherein said smaller  
2 components are further subdivided.

1           28.   The impulse transmission system claim 15, wherein the time layout is a delta  
2 alue layout.  
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